

COMMUNICATIONS EQUIPMENT MODIFICATION NOTE 43 (for Electronics Technicians)

Maintenance Branch

W/OPS12: GSS

SUBJECT : Console Replacement System (CRS) Output Channel Expansion

PURPOSE : To expand the capabilities of the CRS system from a Typical 4-channel to a Large 7-channel configuration.

SITES	:	<u>Site Name</u>	<u>SID</u>	<u>Org. Code</u>
AFFECTED		WFO BALT/WASH	LWX	WN9931
		WFO Central Illinois	ILX	WR9436

EQUIPMENT : CRS (B440)
AFFECTED

PARTS REQUIRED : The parts required will be issued to each site by W/OPS12 from the National Logistics Support Center under the applicable approved site-specific Request for Change.

- (1) Front-end processor (FEP) hold down strap (ASN: B440 STRAP)
- (1) FEP computer (ASN: B440-2A2)
- (1) FEP hard disk drive (HDD) (ASN: B440-2A2A8-FEP)
- (1) Local area network (LAN) board (ASN: B440-1A8A10)
- (1) LAN cable segment (ASN: B440-2W1)
- (1) BNC tee connector (ASN: B440-4J1)
- (1) FEP switch VGA video cable (ASN: B440-2W3)
- (1) FEP switch PS/2 keyboard cable (ASN: B440-2W4)
- (4) DECtalk card (ASN: B440-2A2A11)
- (4) Audio switch module (ASM) cards (ASN: B440-2A6A3)
- (4) DECtalk-ASM audio cable (ASN: B440-4W12)
- (3) NOAA Weather Radio Specific Area Message Encoder (NWRSAME) Encoder-ACP interface cable (ASN: B440-1A5W4)
- (1) DOS formatted diskette with CRS test database ASCII files (provided by W/OPS12)

PARTS SUPPLIED : The following parts are to be provided by the site:
BY THE SITE

- (3) Transmitter audio output cables
- (3) NWRSAME (if available)
- Cable marking tags and tie-wraps as needed

TOOLS AND TEST EQUIPMENT REQUIRED : #1 and #2 Phillips screwdrivers
CRS test database ASCII files diskette provided by W/OPS12
(see Parts Required)
Small flat-blade jeweler's screwdriver
Root mean square (RMS) voltmeter/dB meter
600-ohm dummy load with a RJ-11 plug attached
Antistatic workstation kit

TIME REQUIRED : 2 Hours

EFFECT ON OTHER INSTRUCTIONS : None

AUTHORIZATION : The authority for this modification is Requests for Change NWS504D and CRH697.

VERIFICATION STATEMENT : This procedure has been verified at National Weather Service Headquarters, Silver Spring, MD (SLVM2).

GENERAL : This procedure contains the instructions to add output channel(s) to the CRS system and is contained in the attachments.

PROCEDURE : Attachment **A** provides procedures for implementing this modification.
Attachment **B** (CRS Hardware Drawings) provides reference information.
Attachment **C** provides verification of the new physical configuration (used before applying power).
Attachment **D** provides the Modification Data Pad form.
Attachment **E** provides a completed sample of WS Form A-26, Maintenance Record.

- REPORTING INSTRUCTIONS : Report the completed modification on WS Form A-26, Maintenance Record, according to the instructions in Engineering Handbook No. 4 (EHB-4), Engineering Management Reporting System (EMRS), part 2, and EHB-4 appendix I. Include the following information on the WS Form A 26, Maintenance Record:
- a. An equipment code of '**CRSSA**' in block 7.
 - b. A serial number of '**001**' in block 8.
 - c. The **ASN** and **NSN** of the FEP, four ASM cards, and DECtalk cards in block 13.
 - d. A Mod No. of '**43**' in block 17a.
 - e. **Serial numbers** for the FEP, four ASM cards, and the four DECtalk cards in block 18.

A sample WS Form A-26, Maintenance Record, is provided as attachment E.

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Attachment A - Modification Procedure
Attachment B - CRS Hardware Drawings
Attachment C - New Configuration Physical Verification
Attachment D - Modification Note - Data Note Pad
Attachment E - Sample WS Form A-26

Attachment A
Modification Procedure

Attachment A Modification Procedure

Overview

This modification note provides instructions for expanding a Console Replacement System (CRS) from a TYPICAL 4-channel configuration to a LARGE 7-channel configuration. The modification procedure contains seven parts:

1. CRS Power-Down Procedures
2. Equipment Upgrade Procedures
3. CRS Power-Up Procedures
4. CRS Login and Test Database ASCII File Loading Procedures
5. Post Hardware Expansion Channel Operability Verification Procedures
6. Adding New Transmitter Channels and Editing Site Database ASCII File Procedures
7. ASM Alignment Procedures

- NOTE:**
1. Read the entire procedure, and verify receipt of all required parts before proceeding with the actual modification.
 2. Coordinate with the operations staff before performing this procedure.

CAUTION

CRS must be down to perform the expansion modification. This modification contains test messages that should not be broadcast on any transmitter.

In addition, the site database ASCII file will be recompiled, and all dictionary files will be lost! Switch to the backup NWR system, and ensure the dictionary files are backed up (see the *CRS Administration Manual*) before performing this modification.

- NOTE:**
3. The new FEP setup procedures in part 2, sections 2.1, 2.2, and 2.3, can be performed prior to shutting down the system. This will save downtime of a CRS system that is currently operational.

PART 1-CRS POWER-DOWN PROCEDURES

1.1 CRS Application Shutdown Procedure

1. Click on the **System** menu, and click on **Stop System**.
2. Wait until all icons on the *CRS System Status* menu turn **red**.

1.2 UNIX Shutdown Procedure

NOTE: 1. The shutdown of the CRS application is just one task before the graceful power down. After stopping the CRS application software, implement a “controlled/orderly UNIX shutdown with NO automatic reboot” on the main processor (MP), and implement a “controlled/orderly UNIX shutdown” on all FEPs. Upon completion of the controlled/orderly UNIX shutdown, power down the processors in the following order: MPs first followed by the FEPs.

1. Click on the **Maintenance** menu in the main CRS menu to access the *Maintenance* pull-down menu.
2. Click on **UNIX Shell** in the *Maintenance* pull-down menu. A *UNIX xterm* window pops up for the entry of UNIX commands.
3. Type the following UNIX command in the *xterm* window:
su root
4. Press the **Enter** key. The shell responds with a prompt to enter root passwords.
5. Type the password for the root.
6. Press the **Enter** key. The shell prompt changes to a pound sign indicating that all subsequent UNIX command entries have root authority.
7. Type the following UNIX command in the *xterm* window:
rsh 5MP /sbin/shutdown -i0 -g0 -y
8. Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 5MP. UNIX on processor 5MP shuts down.
9. Type the following UNIX command in the *xterm* window:
rsh 1FEP /sbin/shutdown -i0 -g0 -y
10. Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 1FEP. UNIX on processor 1FEP shuts down.
11. Type the following UNIX command in the *xterm* window:
rsh 4BKUP /sbin/shutdown -i0 -g0 -y

12. Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 4BKUP. The UNIX on processor 4BKUP shuts down.
13. Type the following UNIX commands in the *xterm* window:
 - a. **cd /**
 - b. Press the **Enter** key.
 - c. Type **/sbin/shutdown -i0 -g0 -y**
 - d. Press the **Enter** key. Each CRS processor for the system may be safely powered down when UNIX indicates shutdown is complete with the following message:

Press any key to reboot...

NOTE: 2. Do not reboot any machine; go to section 1.3.

1.3 CRS Hardware Power-Down Procedure

Power down all CRS equipment at the operator's station and in the equipment room by turning off the following equipment:

<u>Operators Station</u>	<u>Equipment Room</u>
0MP and Monitor	4BKUP
5MP and Monitor	1FEP
NWRSAME (all)	LAN Bridge
	LAN Server
	Monitor
	Printer
	Modem
	Audio Switching Assembly (ASA) Power Supplies

PART 2-EQUIPMENT UPGRADE PROCEDURES

- NOTE:**
1. The new FEP setup procedures in part 2, sections 2.1, 2.2, and 2.3, can be performed prior to shutting down the system. This will save downtime of a CRS system that is currently operational.
 2. Attachment D contains the Modification Data Pad. Technicians are asked to complete the form while performing the modification. Use the completed form to assist in reporting serial number data in the EMRS.

2.1 Preliminary 2FEP Setup Procedures

- NOTE:** Removing and replacing circuit cards must be accomplished in an antistatic work area using, approved antistatic procedures.

1. Remove the right side covers of the new **2FEP** unit, using the following procedure:
 - a. Remove the right three screws located on the back of the system unit (see attachment **B**, figure A-1). These screws secure the right side access panel of the system to the chassis.
 - b. Pull the panel backward while lifting it upward.
2. Remove the screws holding expansion slot covers 1, 2, 3, 4, and 6. Retain the screws (see attachment **B**, figure A-13).
3. Remove the expansion slot covers.
4. Install the new LAN card (ASN: B440-1A8A10) in expansion slot number 1, and reinstall a retaining screw.

2.2 Installation of the HDD and Cage Combination Procedure

1. Align the three slides on the HDD cage with the three slots on the upper left corner of the chassis.
2. Insert the slides into the slots holding the HDD cage at an angle away from the chassis.
3. Slide the HDD cage towards the bottom of the chassis, and swing the HDD cage into the chassis body.
4. Align the two screw slots at the top with the threaded holes in the chassis, and secure the HDD cage with two screws.
5. Secure the HDD cage with a single screw at the tab located at the lower right corner of the HDD cage (see attachment **B**, figure A-13).

6. Hook up the HDD cable to the HDD. Cable connectors are keyed and only fit one way. Connect the other end of the HDD cable to the SCSI connector on 2FEP motherboard.
7. Connect a power connector from the power supply to the HDD.

2.3 DECtalk Cards Input/Output (I/O) Address Configuration Procedure

1. Configure the new DECtalk card(s) for the appropriate I/O address through switch 2 (SW2), as defined in table 1 and pictured in attachment **B**, figure A-11.

NOTE: 1. Depending on the CRS site configuration, there may be as many as five DECtalk cards per FEP, located in slots 2 through 6.

Table 1. DECtalk Card Switch 2 (SW2) Settings

Module Number	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	I/O Address	PC Slot
4	off	off	off	off	on	on	380	6
3	off	off	on	on	off	on	360	5
2	on	off	on	off	off	on	328	4
1	off	on	off	on	off	off	250	3
0	off	off	off	on	off	off	240	2

NOTE: 2. Regardless of FEP, DECtalk card configuration remains constant, meaning that modules 0, 1, 2, 3, and 4 are configured the same for each FEP.

2. Use table 1 to set up a DECtalk card with the I/O address: 240
Install the DECtalk card into slot 2 of 2FEP, and reinstall a retaining screw.
3. Use table 1 to set up a DECtalk card with the I/O address: 250
Install the DECtalk card into slot 3 of 2FEP, and reinstall a retaining screw.
4. Use table 1 to set up a DECtalk card with the I/O address: 328
Install the DECtalk card into slot 4 of 2FEP, and reinstall a retaining screw.
5. Use table 1 to set up a DECtalk card with the I/O address: 380
Install the DECtalk card into slot 6 of 2FEP, and reinstall a retaining screw.
6. Replace the 2FEP cover, using the reverse procedure in section 2.1, step 1.

NOTE: 3. Perform Part 1, CRS Power-Down Procedure before proceeding.

2.4 2FEP Computer Installation Procedure

1. Install 2FEP in the CRS main unit cabinet.
2. Install the new 2FEP switch VGA video cable (ASN: B440-2W3) between 2FEP video out and switch position B.
3. Install the new 2FEP switch PS/2 keyboard cable (ASN: B440-2W4) between 2FEP keyboard connection and switch position B.
4. Install the new LAN cable segment (ASN: B440-2W1) and BNC tee (ASN: B440-4J1) connector to connect the 2FEP PC into the existing CRS LAN (2FEP connects between 4BKUP and 5MP). (See attachment **B**, figure A-15).

2.5 ASM Cards Installation Procedure

1. Remove ASA slots 5, 6, 7, and PB2 covers by removing the two screws.

<p>NOTE: There are five jumpers to be set on each ASM card.</p>
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2. Take one of the new ASM cards (ASN: B440-2A6A3), and set the jumpers for the appropriate slot of the ASA in accordance with table 2.

Table 2. ASM Card Jumper Settings

	ASA Slot #	Silence Alarm Jumper "JP1"	ACP Channel Sel. Jumper "JP2" & "JP3"	BKUP Live/ Playback Cntrl Jumper "JP4"	FEP Select Jumper "JP5"
ASM 1 (channel 1)	1	EN (Enable)	1	BUL2	FEP1
ASM 2 (channel 2)	2	EN (Enable)	2	BUL2	FEP1
ASM 3 (channel 3)	3	EN (Enable)	3	BUL2	FEP1
ASM 4 (channel 4)	4	EN (Enable)	4	BUL2	FEP1
ASM 5 (channel 5)	5	EN (Enable)	5	BUL2	FEP2
ASM 6 (channel 6)	6	EN (Enable)	6	BUL2	FEP2
ASM 7 (channel 7)	7	EN (Enable)	7	BUL2	FEP2
ASM PB1 (mon/playback chan 1)	PB1	DIS (Disable)	PB1	PB	FEP1
ASM PB2 (mon/playback chan 2)	PB2	DIS (Disable)	PB2	PB	FEP2

3. Install the new ASM card into the appropriate slot of the ASA chassis, and tighten the two screws.
4. Repeat steps 2 and 3 for each of the remaining ASM cards.

2.6 New DECTalk-ASM Audio Cable Installation Procedure

Using the write-on cable labels, mark and connect the DECTalk-ASM audio cables in accordance with table 3.

Table 3. DECtalk to ASM Audio Cables

From	To	Cable Label
1FEP DECtalk 1 "J2" Port	ASM 1 "IN Port"	1-1
1FEP DECtalk 2 "J2" Port	ASM 2 "IN Port"	1-2
1FEP DECtalk 3 "J2" Port	ASM 3 "IN Port"	1-3
1FEP DECtalk 4 "J2" Port	ASM 4 "IN Port"	1-4
2FEP DECtalk 1 "J2" Port	ASM 5 "IN Port"	2-1
2FEP DECtalk 2 "J2" Port	ASM 6 "IN Port"	2-2
2FEP DECtalk 3 "J2" Port	ASM 7 "IN Port"	2-3
1FEP DECtalk 5 "J2" Port	ASM PB1 "IN Port"	1-5
2FEP DECtalk 5 "J2" Port	ASM PB2 "IN Port"	2-5

2.7 New Transmitter Audio Output Cables Installation Procedure

1. Connect the "OUT 1" port of the new ASM cards at slots 5, 6, and 7 of the ASA chassis by installing the new audio output cable to the demarc panel position for the new transmitters.
2. Install the new NWRSAMEs (if available) into the top panel of the 5MP workstation (if available).
3. Install the NWRSAME-ACP interface cable from the NWRSAME rear connector to the "NWRSAME INPUTS socket 1" port of ACP2 rear panel (this connects to pins 2, 6, 7, 9, and 10 of the NWRSAME) (if available).

NOTE: This completes the hardware modification.

PART 3-CRS POWER-UP PROCEDURES

WARNING

Prior to powering up the FEPs, perform the *New Configuration Physical Verification* procedure contained in attachment C to verify proper system configuration. Failure to perform the procedure can result in transmitter broadcasts assigned to incorrect output channels.

3.1 Power-Up FEP Procedure

1. Press the **ON/OFF** switch (located on the front center right of each enclosure) to power up the FEPs. A green power LED on each FEP lights indicating that power is on. The FEPs can be powered up in any sequence. The FEPs go through a memory check, file system check, system configuration verification [as recognized by the basic I/O system (BIOS)], and then boot the embedded UNIX operating system. At the completion of the boot process, the console screen displays the prompt, **Console Login:**. The embedded operating system automatically initializes to a pre-set level and then waits for final start-up commands from the master MP.

NOTE: The FEPs share a common console through the Shared Monitor Switch. The console displays messages while completing the boot process of the FEP currently switched in.

2. Use the *Shared Monitor Switch* to select the next FEP. The console monitor displays:
Press <F1> to resume, <F2> to Setup.
3. Press **F1** to complete the boot process. The prompt displays:
Console Login:
4. Repeat for each remaining FEP.

3.2 Power-Up Main Processors Procedure

NOTE: 1. Power-up 0MP as the master main processor and 5MP as the shadowing processor.

Press the **ON/OFF** switch (located on the front center right of each enclosure) to power up the MPs. A green power LED on each MP lights indicating that power is on. The MPs can be powered up in any sequence. The MPs go through a memory check, file

system check, system configuration verification (as recognized by the BIOS), and then boot the embedded UNIX operating system. At the completion of the boot process, the workstation screen displays the *CRS Login* screen. The MPs are now ready for the initialization of the CRS application software.

- NOTE:**
2. For Build 6.4 and higher: Following power-up, CRS displays the *Security Screen*. The operator must acknowledge this screen by clicking on the **Acknowledge** button to continue the login process.
 3. Whenever the MPs are powered up, they automatically step through the boot process to the multiuser mode without operator intervention.

3.3 CRS Application Software Installation on the New FEP Procedure

1. From an MP workstation at the CRS Login Screen, type **root** (to logon as root) in the *Login ID* field, and press **Enter**. The cursor moves to the *Password* field.
2. Type in your assigned password, and press **Enter** to complete the CRS login process. The system displays the *UNIXWare Desktop*.
3. Double-click the **Admin_Tools** icon from the *UNIXWare Desktop*. The *Admin Tools* window displays.
4. Double-click the **App_Installer** icon from the *Admin Tools* window. The *Application Installer* window displays. This window is divided into two windows. All procedures that follow are accomplished in the upper window.

- NOTE:**
1. You will need the CD that has your current version of software loaded on the CRS system.

5. Place the CD with the CRS software into the CD-drive.
6. Select **CD-ROM_1**, from the upper window, as your media to install. Three icons display: **crsopsais** (auto installer), **crsopsfpm** (FEP multi-pack), and **crsopsmppm** (MP multi-pack).
7. Select **crsopsais**, and click the **Install** button on the right side of the upper window. The *auto_install* window displays, and the installation script starts. The installation script stops for you to make a selection of the installation type. The following statements display:

Build installation options.

a) all processors (0MP, 5MP, 1FEP, 2FEP, 3FEP, 4BKUP)

f) front-end processors (1FEP, 2FEP, 3FEP, 4BKUP)

m) master processors (0MP, 5MP)

s) specific processor

Select Installation Option (default: a)

8. Type **a**, and press **Enter**. Numerous installation status messages on the *auto_install* window display. Follow the on-screen instructions, and answer any questions. When the installation process is complete, the CRS displays:
Continue OMP shutdown? (default: y)
9. Press **Enter** to reboot OMP.

NOTE: 2. For Build 6.4 and higher: Following power-up, CRS displays the *Security Screen*. The operator must acknowledge the *Security Screen* by clicking on the **Acknowledge** button to display *Login* screen, and continue the login process.

10. Use the **Shared Monitor Switch** on the equipment rack to select the next FEP for rebooting. The console monitor displays:
Press <F1> to resume, <F2> to Setup.
11. Press **F1** to complete the boot process. The prompt displays:
Console Login:
12. Repeat for each remaining FEP.

PART 4-CRS LOGIN AND TEST DATABASE ASCII FILE LOADING PROCEDURES

4.1 CRS Login Procedure

NOTE: 1. For Build 6.4 and higher: Following power-up, CRS displays the *Security Screen*. The operator must acknowledge the *Security Screen* by clicking on the **Acknowledge** button to continue the login process.

2. The *CRS Login Screen* allows you to log onto CRS. This screen contains two fields, i.e., *Login ID* and *Password*. The fields are provided to allow you to type in your assigned login ID and password.

1. Type **admin** (for system administrator) in the *Login ID* field, and press **Enter**. The cursor moves to the *Password* field.
2. Type in your assigned password, and press **Enter** to complete the CRS login process. The system displays the *CRS Main* display. In addition, the system displays the following error message:
System is not operational. Perform 'Start CRS' to start system.
3. Click on **OK** to clear the message.

NOTE: 3. The error message is only a status message indicating CRS is not running.

4.2 CRS Applications Software Installation Error Verification Procedure

1. Open a UNIX Shell:
 - a. Click on **Maintenance**
 - b. Click on **UNIX Shell**
2. Type **grep ERROR /crs/install.log**, and press **Enter**.
3. Ensure there are no error messages. Any error messages must be reported to the CRS Site Support Staff at 301-713-0191 x145 or x144.
4. Type **grep WARNING /crs/install.log**, and press **Enter**.
5. Ensure there are no error messages. Any error messages must be reported to the CRS Site Support Staff at 301-713-0191 x145 or x144.

NOTE: Ignore any IP address error messages.

4.3 CRS Test Database ASCII File Loading Procedure

NOTE: 1. The following instructions for loading the CRS test database ASCII assume everything is being done with OMP set as the MP.

1. Place the diskette with CRS test database ASCII files in the OMP diskette drive to copy the desired file from the diskette to CRS.
 - a. Type **dosdir a:** and press the **Enter** key to display a directory listing of the files on the test database diskette. There are 13 files on the diskette with the following filename convention:

TYPW_CFG.ASC	where W = 1 - 4
LRGX_CFG.ASC	where X = 5 - 8
MAXY_CFG.ASC	where Y = 9
MAXZ_CF.ASC	where Z = 10 - 13

(W, X, Y, and Z represent the number of transmitters supported by your CRS)
 - b. Locate the applicable test database ASCII file.
 - c. Type **doscp a:filename /crs/data/SS/filename**.

NOTE: 2. Where **filename** is the name of the CRS test database ASCII file to be used.

- d. Press the **Enter** key.
2. Click and hold the left mouse button on any white space, move the cursor to select **XCRS_SITE Utility**, and release the button to bring up the *XCRS_SITE Utility* window.

3. Click on the **Select ASCII Site Setup** button to bring up the list of ASCII files.
4. Select the desired database ASCII filename copied from the diskette in section 4.3, step 1.c, and double click.

NOTE: 3. The directory selection block has a default directory name of **/crs/data/SS**, and the file filter block has a default file name of **/crs/data/SS/*.ASC**. If the desired filename does not appear, it may have copied to the wrong directory in section 4.3, step 1.c. If that is the case, change the default directory name to the directory specified in section 4.3, step 1.c. The other reason the filename does not appear is because it is being filtered out. Remember, UNIX is case sensitive and if copied with an asc extension that was in lower case, it does not display. Change the filter file name to **/crs/data/SS/*.asc**, and the filename displays.

5. Select **Initialize System Configuration and Database** to ensure the entire system database and configuration is erased and replaced.
6. Click on the **Start Site Configuration** button. The system displays:
Will now perform FULL site reconfiguration. Continue?
7. Click on **OK**. The “wristwatch” and the “working” message display. Several messages scroll by. The last message reads:
Finished with site configure
The “wristwatch” and “working” message disappear. Ensure there are no error messages at the completion of the site configuration process.
8. Restart CRS by clicking on **Start CRS System**. The system displays:
The CRS system will be STARTED. Continue?
9. Click on **OK**. The “wristwatch” and the “working” message display. Several messages scroll by. The last message refers to starting 4BKUP. The “wristwatch” and “working” message disappear.
10. Click on **EXIT** to close the *XCRS_SITE Utility* window.
11. Click on the **UNIX shell** window to select it. At the prompt, type **Exit**, and press **Enter** to close the *UNIX Shell*.
12. Open the *System Status* window:
 - a. Click on **System**.
 - b. Click on **System Status**.
13. Monitor the *System Status* window, and ensure the system is operational.

PART 5-POST HARDWARE EXPANSION CHANNEL OPERABILITY VERIFICATION PROCEDURES

5.1 Channel Operability Verification Procedure

NOTE: CRS test database ASCII files contain test messages configured for continuous broadcast for channel operability verification.

1. Connect a monitor speaker or headphones to the ACP.
2. Use the **Channel Select** control to select each channel, one at a time, and monitor the output for the correct message (i.e., with Channel one selected, the message output is: *This is transmitter one, audio switch module one.*).

5.2 FEP Backup Mode Channel Operability Verification Procedure

1. Click on **Maintenance**.
2. Click on **Front-End Processor Switch**.
3. Select **1** in the *Front-End Processor Switch* window under FEP.
4. Select **Out** under *Switch*.
5. Select **Yes** under *Backup*.
6. Click on the **Save the current record** icon to execute the FEP switch process. The *Question* box displays:
Switch out the FEP FULLY offline ???
7. Click on **OK** to continue. The system displays the “wristwatch” and the message:
“Requesting FEP Switchout”.
8. Monitor the *FEP1* and *BKUP System Status* icons, and verify FEP1 is in backup mode and the *BKUP* icon displays the online status.
9. Upon completion of the FEP switch process, repeat section 5.1, steps 1 and 2.
10. Upon completion of the FEP backup mode channel operability verification, perform the following to display the *Front-End Processor Switch* window:
 - a. Click on **Maintenance**.
 - b. Click on **Front-End Processor Switch**.
11. In the *Front-End Processor Switch* window under FEP: select **1**.
12. Under *Switch*: select **IN** to switch FEP1 back in.
13. Click on the **Save the current record** icon to execute the FEP switch process. The system displays the “wristwatch” and the message displays:
Requesting FEP switch-in...

14. Monitor the *FEP1* and *BKUP System Status* icons, and verify FEP1 is online and the BKUP icon displays the backup mode status.
15. When the system returns to normal operation, perform the following steps to close the *Front-End Processor Switch* window and stop CRS:
 - a. On the *Front-End Processor Switch* window:
 - 1) Click on **File**.
 - 2) Click on **Exit**.
 - b. On the *Main CRS* menu:
 - 1) Click on **System**.
 - 2) Click on **Stop System**.
 - 3) Click on **OK**.
 - 4) Click on **Close**.
16. Monitor the *System Status* window, and verify the CRS application has stopped.

PART 6-ADDING NEW TRANSMITTER CHANNELS AND EDITING SITE DATABASE ASCII FILE PROCEDURES

6.1 Adding New Transmitter Channels Procedure

1. Click and hold the left mouse button on any white space, move the cursor to select **XCRS_SITE Utility**, and release the button to bring up the *XCRS_SITE Utility* window.
2. Click on **Select ASCII Site Setup** button to bring up the list of ASCII files.
3. Select the current site database ASCII file and double click.
4. Click on **Add Transmitter(s)** button to start the **addxmt** program. It displays the number of transmitters currently available, the next available transmitter to be added, and its appropriate processor and slot.
5. Use the following steps to add a new transmitter to the *Site Database ASCII* file:
 - a. Mnemonic
 - b. Call Sign
 - c. Frequency
 - d. Location of the new transmitter
6. Use the following sequence of steps for each transmitter to be added:
 - a. **Mnemonic**
 - 1) Type option number **1<Enter>** to select the *Mnemonic*.

- 2) Type **a<Enter>** at the program prompt to add the *Mnemonic*.
- 3) Type **mmmmm<Enter>** (where mmmm is the desired *Mnemonic*), up to a length of 5 characters. The program returns the *Mnemonic*.
- 4) Type **0** or **<Tab> <Enter>** to complete the *Mnemonic* selection.
- b. **Call Sign**
 - 1) Type option number **2<Enter>** to select the *Call Sign*.
 - 2) Enter the **Call Sign** in the same manner as the *Mnemonic*, up to a length of 5 characters. The program returns the *Call Sign*.
 - 3) Type **0** or **<Tab> <Enter>** to complete the *Call Sign* selection.
- c. **Frequency**
 - 1) Type option number **3<Enter>** to select *Frequency*. The *Frequency* option only allows a selection of one of the seven choices listed.
 - 2) Type **n<Enter>** (where n is the desired frequency choice). The program returns the *Frequency* choice by displaying an asterisk next to the *Frequency* selection.
 - 3) Type **0** or **<Tab> <Enter>** to complete the *Frequency* selection.
- d. **Location**
 - 1) Type option number **4<Enter>** to select *Location*.
 - 2) Enter the **Location** (in the same manner as the *Mnemonic* and the *Call Sign*) up to a length of 40 ASCII characters. The program returns the *Location*.
 - 3) Type **0** or **<Tab> <Enter>** to complete the *Location* selection.
- e. **Add Transmitter**
 - 1) Type option number **5<Enter>** to use all the parameters defined in the first four steps to configure a new transmitter in the database ASCII file. The program indicates a new transmitter is needed.
 - 2) Type **y<Enter>**. The program returns the assignment of each transmitter to its proper processor and slot. The program tells you the appropriate database ASCII file has been updated and the original has been saved with the .SAV extension.
7. The program then asks if another transmitter is needed. If so, repeat steps 6a through e for the next new transmitter. If not, type **n<Enter>** to exit the program.

6.2 Editing the Site Database ASCII File Procedure

1. When exit **addxmt** is done, the *Question* box displays:
Ready to recompile selected ASCII file. Continue?

2. Click on **Cancel** to close the *Question* box.
3. Select **Initialize System Configuration and Database** to ensure the entire system database and configuration is erased and replaced.
4. Click on **Start Site Configure**. The *Question* box displays:
Will now perform FULL site reconfiguration. Continue?
5. Click on **OK** to recompile the database ASCII file. Upon completion of the database ASCII file recompile process, the system displays:
Finished with site configure.
6. Restart CRS by clicking on **Start CRS System**. The system displays:
The CRS system will be STARTED. Continue?
7. Click on **OK**. The “wristwatch” and the “working” message display. Several messages scroll by. The last message refers to starting 4BKUP, and the “wristwatch” and “working” message disappear.
8. Click on **Exit** to close the *XCRS_SITE Utility* window.
9. Open the *Alert Monitor* window:
 - a. Click on **System**.
 - b. Click on **Alert Monitor**.

NOTE: No attempt is made by **addxmt** to establish station identifiers, broadcast programs, broadcast suites, message types, voice parameters, keep-alive messages, interrupt messages, etc. for the new transmitters. These must be configured through the CRS graphical user interface (see the *CRS Site Operator's Manual*) and updated in the site database ASCII file.

PART 7-ASM ALIGNMENT PROCEDURES

NOTE: The output of each added ASM card must be aligned before placing in service. The alignments must be performed in the following sequence:

1. Verify ACP **Ref.** Mark Alignment.
2. ASM Card Alignment.

7.1 Verify ACP Ref. Mark Alignment Procedure

- NOTE:**
1. The ACP Ref. mark alignment can be performed independently and does not require the use of any tool or equipment.
 2. Transmitter x in this procedure refers to the channel under test.

1. Set up the CRS for BUL. No system database is required.
2. Set the index mark on the **tone volume control** knob to the **Ref.** position.
3. Push the **Transmitter x** and **Enable** buttons in sequence to start BUL on channel x. The buttons are located in the **BACKUP LIVE** block area on the ACP front panel.

NOTE: 3. Do not send audio to a transmitter while performing this procedure.

4. Push the **Alert Tone 1** button to generate the 1050 Hz warning alert tone (WAT).
5. Ensure the VU meter on the ACP front panel indicates **0 dBm**.

NOTE: 4. The duration of 1050 Hz WAT is 10 seconds.

6. Adjust the tone volume control for a reading of **0 dBm**.
7. Repeat steps 4, 5, and 6 as necessary to obtain a reading of **0 dBm**.

NOTE: 5. When the tone volume control is set to the true Ref. position, the ACP provides the selected WAT output level of **0 dBm**.

8. To stop BUL, first push the **Enable** button, then push the **Transmitter x** button.

7.2 ASM Card Alignment Procedure

NOTE:

1. This alignment requires two people: one in the operations room and one in the equipment room.
2. When performing any of the following alignments, the system's output(s) must be disconnected from the telecommunications link and terminated into a 600-ohm load. All audio signal level measurements are taken across the 600-ohm load.

1. Assemble the following required equipment:
 - dB meter to read the audio signal level,
 - small jeweler's screwdriver, and
 - 600-ohm dummy load with RJ-11 plug attached.
2. Set up the CRS for BUL. No system database is required.
3. Set the index mark on the tone volume control knob to the **Ref.** position as described in section 7.1, Verify ACP Ref. Mark Alignment Procedure.

4. Push the **Transmitter x** and **Enable** buttons in sequence to start BUL on channel x. The buttons are located in the **BACKUP LIVE** block area on the ACP front panel.
5. Plug the RJ-11 connector (with the 600-ohm load attached) into the RJ-11 jack of **OUT 1** on the ASM of transmitter x (output channel x).
6. Connect the dB meter across the 600-ohm load.
7. Push the **Alert Tone 1** button to send a WAT to the **OUT 1** jack of ASM card 1.
8. Measure and record the signal level in dB across the 600-ohm load.
9. Using a small jeweler's screwdriver, adjust the transmitter gain control potentiometer through the ASM front panel until a reading of **0 dBm** is obtained across the 600-ohm load.

NOTE: 3. Table 4 provides equivalent V_{rms} and V_{p-p} values related to dBm (all referenced to 600-ohms) as an aid in referencing readings taken with measurement equipment that may not read directly in dBm.

Table 4. Voltages vs dBm (into 600-ohm load)

dBm	RMS	P-P	dBm	RMS	P-P	dBm	RMS	P-P
10	2.440	6.93	-4	0.480	1.35	-17	0.110	0.301
9	2.183	6.17	-5	0.430	1.20	-18	0.097	0.270
8	1.946	5.50	-6	0.390	1.03	-19	0.087	0.240
7	1.734	4.90	-7	0.345	0.96	-20	0.0775	0.215
6	1.546	4.37	-8	0.306	0.85	-21	0.0690	0.194
5	1.377	3.89	-9	0.275	0.76	-22	0.061	0.170
4	1.228	3.47	-10	0.245	0.68	-23	0.054	0.152
3	1.094	3.01	-11	0.213	0.61	-24	0.048	0.135
2	0.975	2.75	-12	0.192	0.54	-25	0.043	0.120
1	0.869	2.46	-13	0.173	0.48	-26	0.039	0.108
0	0.775	2.15	-14	0.154	0.43	-27	0.034	0.096
-1	0.690	1.94	-15	0.138	0.38	-28	0.031	0.085
-2	0.610	1.70	-16	0.125	0.34	-29	0.028	0.076
-3	0.540	1.52				-30	0.024	0.068

- NOTE:**
4. The WAT output from the ACP nominally lasts 10 seconds. It is recommended that a second person push the **Alert Tone1** button for a near continuous tone output. This will smooth out the calibration effort, and minimize the time required.
 5. Primary (Out1) and secondary (Out2) outputs are two independent outputs. However, the output level of Out1 is affected by approximately 1.5 dB if Out2 is loaded.
 6. During BUL, the VU meter monitors the ACP tone output, not the output of the ASM card. The ACP tone output is sent to the ASM card via the ASC for final output.

10. Repeat steps 7, 8, and 9 as necessary to obtain a reading of **0 dBm** for the channel under test.
11. To stop BUL, first push the **Enable** button, and then push the **Transmitter x** button.
12. Repeat steps 1 through 10 to align each of the new ASM cards in the system.
13. Remember to activate each ASM card output by pushing the respective **Transmitter x** button, and then the **Enable** button.

Attachment C

New Configuration Physical Verification

Attachment C New Configuration Physical Verification

7-Channel System

Required MPs, FEPs, DECtalks, ASC, and ASMs

The **LARGE-7** system has 2 MPs (0MP and 5MP), 3 FEPs (1FEP, 2FEP, and 4BKUP), 14 DECtalk cards, 1 ASC card, and 10 ASM cards:

0MP	main processor 1		
5MP	main processor 2		
1FEP	front end processor 1		
	LAN Card	LAN interface	(slot 1)
	DECtalk 1	channel 1	(slot 2)
	DECtalk 2	channel 2	(slot 3)
	DECtalk 3	channel 3	(slot 4)
	DECtalk 4	channel 4	(slot 5)
	DECtalk 5	PB1	(slot 6)
2FEP	front end processor 2		
	LAN Card	LAN interface	(slot 1)
	DECtalk 1	channel 5	(slot 2)
	DECtalk 2	channel 6	(slot 3)
	DECtalk 3	channel 7	(slot 4)
	DECtalk 5	PB2	(slot 6)
4BKUP	backup front end processor		
	LAN Card	LAN interface	(slot 1)
	DECtalk 1	backup channel 1 or 5	(slot 2)
	DECtalk 2	backup channel 2 or 6	(slot 3)
	DECtalk 3	backup channel 3 or 7	(slot 4)
	DECtalk 4	backup channel 4	(slot 5)
	DECtalk 5	backup PB1 or PB2	(slot 6)
ASA	audio switch assembly		
ASC	audio switch controller		
	ASM 1	channel 1	(slot 1)
	ASM 2	channel 2	(slot 2)
	ASM 3	channel 3	(slot 3)
	ASM 4	channel 4	(slot 4)
	ASM 5	channel 5	(slot 5)
	ASM 6	channel 6	(slot 6)
	ASM 7	channel 7	(slot 7)
	ASM PB1	monitor/playback channel 1	(slot PB1)
	ASM PB2	monitor/playback channel 2	(slot PB2)
	ASM Spare	spare	(slot S)

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DECtalk Card Configurations

There is one I/O jumper to be set on each DECtalk card:

	FEP Name	FEP EISA Slot #	I/O Address Jumper
1FEP DECtalk 1 (channel 1)	1FEP	2	240
1FEP DECtalk 2 (channel 2)	1FEP	3	250
1FEP DECtalk 3 (channel 3)	1FEP	4	328
1FEP DECtalk 4 (channel 4)	1FEP	5	360
1FEP DECtalk 5 (mon/playback chan 1)	1FEP	6	380
2FEP DECtalk 1 (channel 5)	2FEP	2	240
2FEP DECtalk 2 (channel 6)	2FEP	3	250
2FEP DECtalk 3 (channel 7)	2FEP	4	328
2FEP DECtalk 5 (mon/playback chan 2)	2FEP	6	380
4BKUP DECtalk 1	4BKUP	2	240
4BKUP DECtalk 2	4BKUP	3	250
4BKUP DECtalk 3	4BKUP	4	328
4BKUP DECtalk 4	4BKUP	5	360
4BKUP DECtalk 5	4BKUP	6	380

ASM Card Configurations

There are five jumpers to be set on each ASM card:

	ASA Slot #	Silence Alarm Jumper "JP1"	ACP Channel Sel. Jumper "JP2" & "JP3"	BKUP Live/ Playback Cntrl Jumper "JP4"	FEP Select Jumper "JP5"
ASM 1 (channel 1)	1	EN (Enable)	1	BUL2	FEP1
ASM 2 (channel 2)	2	EN (Enable)	2	BUL2	FEP1
ASM 3 (channel 3)	3	EN (Enable)	3	BUL2	FEP1
ASM 4 (channel 4)	4	EN (Enable)	4	BUL2	FEP1
ASM 5 (channel 5)	5	EN (Enable)	5	BUL2	FEP2
ASM 6 (channel 6)	6	EN (Enable)	6	BUL2	FEP2
ASM 7 (channel 7)	7	EN (Enable)	7	BUL2	FEP2
ASM PB1 (mon/playback chan 1)	PB1	DIS (Disable)	PB1	PB	FEP1
ASM PB2 (mon/playback chan 2)	PB2	DIS (Disable)	PB2	PB	FEP2

ASC Card Configuration

There is a 7-by-3 matrix switch to be set up on each ASC card:

Set the backup channel configuration using the seven jumpers on JP1. Using all seven jumpers, move the jumpers to the side of the block that lists the number of output channels for your site configuration, the center row of pins being common. Example: Using **Figure 1** as a reference, if your site configuration had 5, 6, 9, or 10 channels, the jumpers would connect from the center row of pins to the top row of pins. If your site configuration had 1, 2, 3, 4, 7, 8, 11, 12, or 13 channels, the jumpers would connect from the center row of pins to the bottom row of pins.

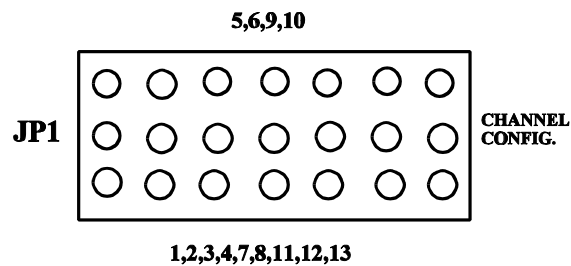


Figure 1 ASM Card Jumper Block

Cable Label Between DECtalk Card and ASM Card

From	To	Cable Label
1FEP DECtalk 1 "J2" Port	ASM 1 "IN Port"	1-1
1FEP DECtalk 2 "J2" Port	ASM 2 "IN Port"	1-2
1FEP DECtalk 3 "J2" Port	ASM 3 "IN Port"	1-3
1FEP DECtalk 4 "J2" Port	ASM 4 "IN Port"	1-4
2FEP DECtalk 1 "J2" Port	ASM 5 "IN Port"	2-1
2FEP DECtalk 2 "J2" Port	ASM 6 "IN Port"	2-2
2FEP DECtalk 3 "J2" Port	ASM 7 "IN Port"	2-3
1FEP DECtalk 5 "J2" Port	ASM PB1 "IN Port"	1-5
2FEP DECtalk 5 "J2" Port	ASM PB2 "IN Port"	2-5

Cable Label Between DECtalk Card and ASC Card

From	To	Cable Label
4BKUP DECtalk 1 "J2" Port	ASC "BKUP Audio 1" Port	4-1
4BKUP DECtalk 2 "J2" Port	ASC "BKUP Audio 2" Port	4-2
4BKUP DECtalk 3 "J2" Port	ASC "BKUP Audio 3" Port	4-3
4BKUP DECtalk 4 "J2" Port	ASC "BKUP Audio 4" Port	4-4
4BKUP DECtalk 5 "J2" Port	ASC "BKUP Audio 5" Port	4-5

Attachment D
Modification Note - Data Note Pad

Modification Note - Data Note Pad

CRS Mod Note #43
Supplemental Info

Instructions: This form is supplied to assist in the reporting of Configuration Management Data. Technicians are asked to complete this form **while** the Modification is being performed. When completed, use form to assist you in reporting the data using the EMRS. DO NOT SUBMIT THIS FORM.

Mod. Completion Date _____

Configuration Management Data Note Pad				
ASN	Vendor Part Number	Serial Numbers		Notes
		Old Part	New Part	
B440-2A2	KSP-9521-HW	N/A		
B440-2A2A11	EBD07-AA/DTC07-BM	N/A		
B440-2A2A11	EBD07-AA/DTC07-BM	N/A		
B440-2A2A11	EBD07-AA/DTC07-BM	N/A		
B440-2A2A11	EBD07-AA/DTC07-BM	N/A		
B440-2A6A3	CRS-ASM	N/A		
B440-2A6A3	CRS-ASM	N/A		
B440-2A6A3	CRS-ASM	N/A		
B440-2A6A3	CRS-ASM	N/A		

Attachment D

D-1

Attachment E

Sample WS Form A-26

		WS FORM A-26 (4/94)				U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE				Document Number G 49986	
ENGINEERING MANAGEMENT REPORTING SYSTEM MAINTENANCE RECORD											
General Information		1. Open Date 8 / 24 / 00	Time 0900	2. Initials JMM	3. Response Priority (check one) <input type="radio"/> Immediate <input type="radio"/> Routine <input checked="" type="radio"/> Low <input type="radio"/> Not Applicable			4. Close Date 8 / 24 / 00	Time 1100		
5. Description Expand CRS from a Typical 4 to a Large 7 Configuration											
Equipment Information		6. Station ID LWX	7. Equipment Code CRSSA	8. Serial Number 001		9. TM M		10. AT M	11. How Mal. 999		
12. EQUIPMENT OPERATIONAL STATUS TIMES		a. Fully Operational <input type="text"/>	b. Logistics Delay <input type="text"/>	Partly Operational		c. All Other <input type="text"/>		d. Logistics Delay <input type="text"/>	Not Operational		e. All Other <input type="text"/>
13. Parts Failure Information									14. Work Load Information		
Block #	a. ASN	b. NSN		c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.	Type	Staff Hrs.	
1	B440-2A2	5962-01-451-0639		M	M	999	1	1:00	a. Routine		
2	B440-2A2A11	5998-01-448-9178		M	M	999	4	0:30	b. Non-Routine		
3	B440-2A6A3	NWS9-80-990-0017		M	M	999	4	0:30	c. Travel		
4									d. Misc.	2:00	
5									e. Overtime		
Miscellaneous Information		15. Maintenance Comments Installed 1 FEP, 4 DECTalk cards, and 4 ASM cards to expand CRS from Typical 4 to Large 7 configuration, I.A.W. Mod Note 43								16. Initials JMM	
17. SPECIAL PURPOSE REPORTING		a. Mod. No. 43	b. Mod./Act./Deact.Date	c.	d.		e.				
18. CONFIGURATION MGMT. REPORTING (use as directed)		ASN B440-2A2	Vendor Part No. (New Part) KSP-9521-HW		Serial Number (Old Part) N/A		Serial Number (New Part) 6RSEKG0000				
		B440-2A2A11	EBD07-AA/DTC07-BM		N/A		N123456789				
		B440-2A2A11	EBD07-AA/DTC07-BM		N/A		N123456789				
		B440-2A2A11	EBD07-AA/DTC07-BM		N/A		N123456789				
		B440-2A2A11	EBD07-AA/DTC07-BM		N/A		N123456789				

E-1

Attachment E